# Rapporto di test n° TR_17337
*Test report n° TR_17337*

# Prova di immunità ad impulso
# *Surge immunity test*
Rif: procedura di test IL 22010
*Ref: test procedure IL22010*

| | |
|---|---|
| **Dispositivo testato**<br>***Tested sample*** | COMPACT 32 500 M J1900 ACL MD SCL |
| **P/N**<br>***P/N*** | 993201600101 |
| **Modelli derivati**<br>***Derived models*** | / |
| **Persone presenti**<br>***Attendees*** | / |
| **Costruttore**<br>***Manufacturer*** | AESYS S.p.A. - Via Pastrengo 7c<br>24068 Seriate (BG) Italia<br>Tel: +39 0352924111<br>www.aesys.com |
| **Laboratorio**<br>***Test laboratory*** | AESYS S.p.A. - Via Pastrengo 7c<br>24068 Seriate (BG) Italia<br>Tel: +39 0352924111<br>www.aesys.com |
| **Data del test**<br>***Test date*** | 04/12/2017 |
| **Prima emissione**<br>***First issue*** | 04/12/2017 |

| | | |
|---|---|---|
| **Tecnico di laboratorio**<br>***Test engineer*** | Sergio Fustinoni | ……... |
| **Responsabile di laboratorio**<br>***LAB Manager*** | Egidio A. Fogliata | ……... |
| **Revisione**<br>***Revision*** | 00 | Primo rilascio<br>*First release* |



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# Sommario
*Contents*

**1 DUT - INFORMAZIONI GENERALI ..... 3**
*DUT - GENERAL PRODUCT INFORMATION ..... 3*
**2 NORMATIVE DI RIFERIMENTO ..... 4**
*REFERENCE NORMATIVE ..... 4*
**3 PROCEDURA DI TEST DI RIFERIMENTO ..... 4**
*REFERENCE TEST PROCEDURE ..... 4*
**4 STRUMENTAZIONE UTILIZZATA PER IL TEST ..... 4**
*USED TEST MEASUREMENT INSTRUMENTS ..... 4*
**5 PARAMETRI DI TEST ..... 4**
*TEST PARAMETERS ..... 4*
**6 REGISTRAZIONE TEST ..... 5**
*TEST RECORDING ..... 5*
6.1 IMPOSTAZIONE TEST ..... 5
*TEST SETUP ..... 5*
**7 ESITO DEL TEST ..... 7**
*TEST RESULT ..... 7*



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# 1 DUT - INFORMAZIONI GENERALI
*DUT - GENERAL PRODUCT INFORMATION*

The DUT (Device Under Test), named **COMPACT 32 500 M J1900 ACL MD SCL** is a variable message panel based on TFT technology used for video-information in railways applications.

*DUT – COMPACT 32 500 M J1900 ACL MD SCL*

*DUT – Product identification label*



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## 2 NORMATIVE DI RIFERIMENTO
*REFERENCE NORMATIVE*

All the tests are managed according the European standard **EN 50121-4**: *Railway applications - Electromagnetic compatibility - Part 4: Emission and immunity of the signalling and telecommunications apparatus.*

## 3 PROCEDURA DI TEST DI RIFERIMENTO
*REFERENCE TEST PROCEDURE*

The test was performed following the Aesys internal reference procedure named *IL 22010 Surge*.

## 4 STRUMENTAZIONE UTILIZZATA PER IL TEST
*USED TEST MEASUREMENT INSTRUMENTS*

| Description | Model | Manufacturer | Serial n° | Calibration n° | Calibration date |
|---|---|---|---|---|---|
| Surge generator | Transient 2000 | EMC Partner | 832 | ISO 00068/17 | 26/01/2017 |

## 5 PARAMETRI DI TEST
*TEST PARAMETERS*

The test method is compliant to the requirements of standard **EN 61000-4-5:** *Testing and measurement techniques – Surge immunity test.*

**Test setup:** A ground reference plane copper with 0.5mm thickness, is positioned on the laboratory floor.

**Test levels:** ±2kV for open circuit test voltage, L to GND and N to GND
±1kV for open circuit test voltage, L to N

**Front time:** 1.2µs
**Time to half value**: 50µs
**Interval between successive pulses:** 10s

**Environmental conditions:** Temperature range: 15°C to 35°C
Relative humidity: 25 to 75%
Pressure: 860 to 1060hPa

**Test measurements uncertainty:** Amplitude: ± 0.20 kV
Rise time: ± 0.05 µs
Duration: ± 2.8 µs

The measurement uncertainties stated in this document are estimated as extended uncertainty obtained multiplying the standard uncertainty by the coverage factor *k* corresponding to a confidence level of about 95%.



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# 6 REGISTRAZIONE TEST
*TEST RECORDING*

## 6.1 Impostazione test
*Test setup*

| Test | Performance criteria | Result | Verdict |
|---|---|---|---|
| Environmental temperature | Between +15°C and +35°C | +24.3°C | **Passed** |
| Relative humidity | Between 25% and 75% | 27% | **Passed** |
| Pressure | Between 860 and 1060hPa | 1020hPa | **Passed** |
| Functionality | Correct operation and data communications | Dynamic image always displayed<br>Correct data communication | **Passed** |

The following surge pulses are applied to the power port, as established the standard **EN 50121-4**:

- 5 positive surge pulses with voltage 1kV for open circuit test voltage, L to N
- 5 negative surge pulses with voltage 1kV for open circuit test voltage, L to N

- 5 positive surge pulses with voltage 2kV for open circuit test voltage, L to GND
- 5 negative surge pulses with voltage 2kV for open circuit test voltage, L to GND

- 5 positive surge pulses with voltage 2kV for open circuit test voltage, N to GND
- 5 negative surge pulses with voltage 2kV for open circuit test voltage, N to GND

The test results passed if it meets the criteria for performance evaluation B, as specified by **EN 61000-4-5**:

- Class B: Degradation of the operation is allowed only during the test.



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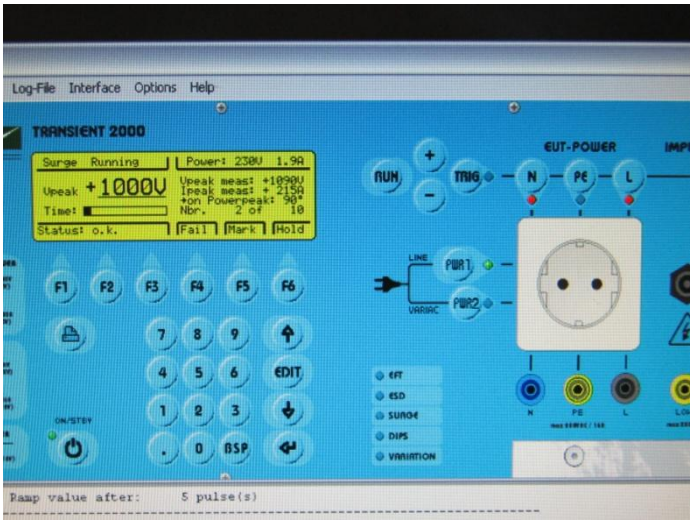
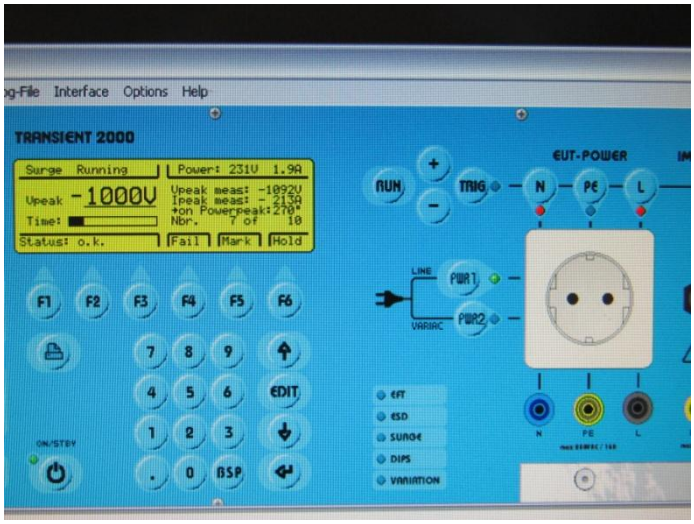
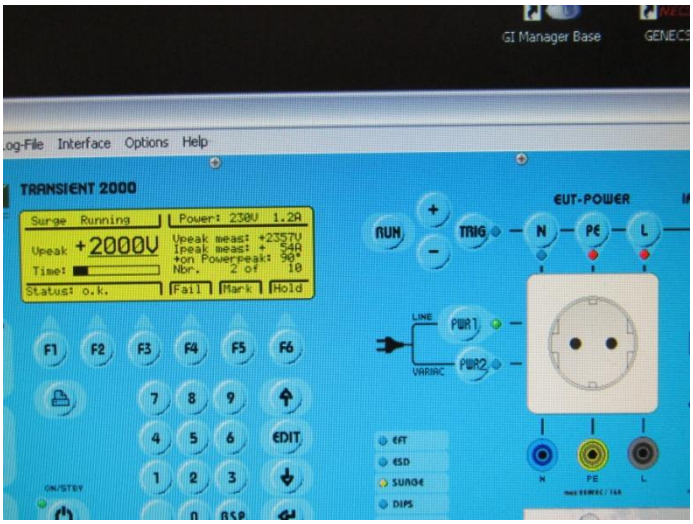


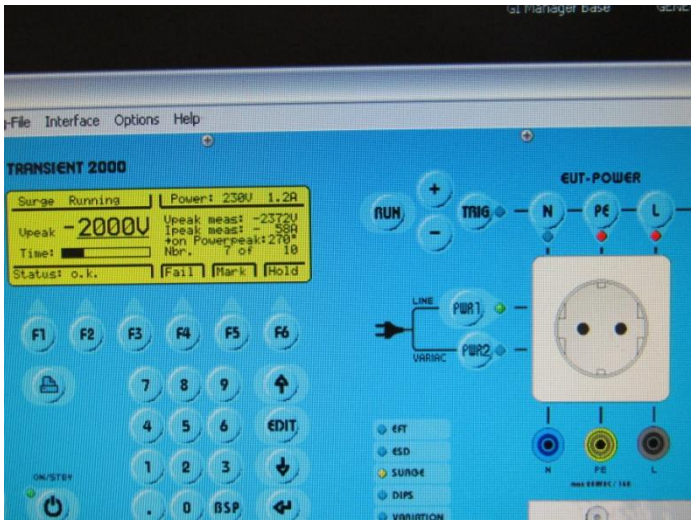

*Generator during the positive surge, L to N*



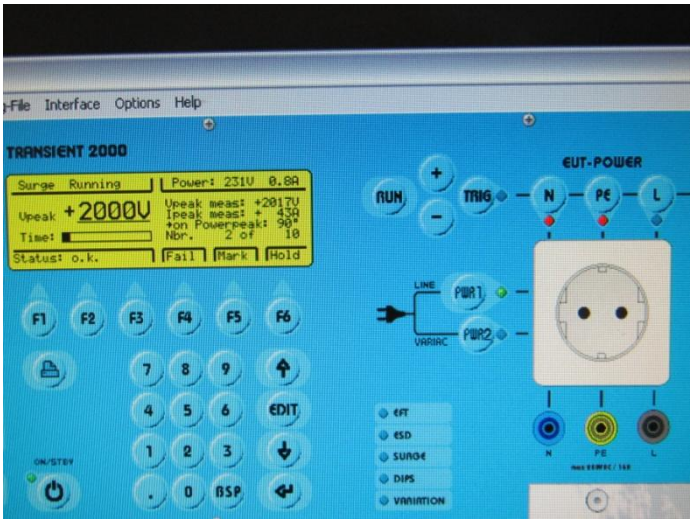

*Generator during the negative surge, L to N*



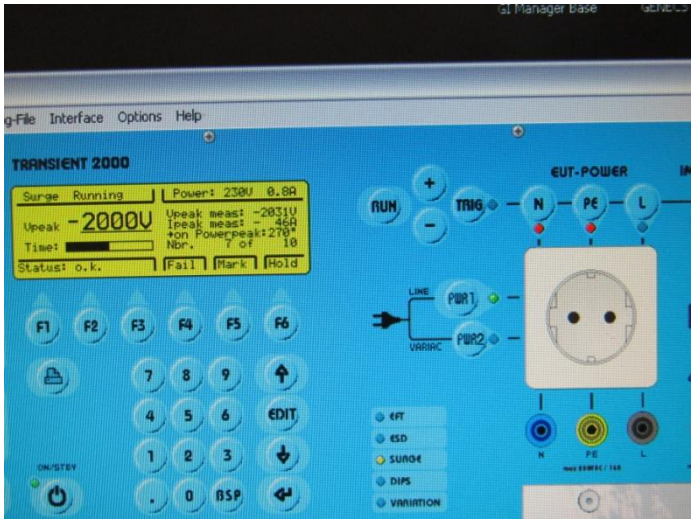

*Generator during the positive surge, L to GND*




*Generator during the negative surge, L to GND*




*Generator during the positive surge, N to GND*




*Generator during the negative surge, N to GND*

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*DUT during the test on the power port*

# 7 ESITO DEL TEST
*TEST RESULT*

| Test | Coupling | Severity | Required | Result | Verdict |
|---|---|---|---|---|---|
| Surge, L to N | Positive | 1kV | Class B | Class A | **Passed** |
| | Negative | 1kV | Class B | Class A | **Passed** |
| Surge, L to GND | Positive | 2kV | Class B | Class A | **Passed** |
| | Negative | 2kV | Class B | Class A | **Passed** |
| Surge, N to GND | Positive | 2kV | Class B | Class A | **Passed** |
| | Negative | 2kV | Class B | Class A | **Passed** |

FINE DEL TEST REPORT
*End of test report*



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